

Battery Chargers

JAMES STANBURY
tests 10 battery
chargers and explains
why now is the time
to give your battery
some TLC.

THE TESTS

PRACTICALITY

The first two points only went to chargers with the longest leads, with an extra point being awarded to any unit supplied with permanently-attached easy-connect leads. Another point went to all units that were sufficiently well-sealed to allow safe outside usage.

SPEED We watched the early stages of each charger's cycle on an oscilloscope to check the smoothness of output and to see if the charger began with a plate-clearing pulsed blast. Two points – one for smoothness, one for plate-clearing – were up for grabs. Up to two further points were available for chargers with the highest current outputs, and an extra point was awarded to units with manually selectable boost modes.

FEATURES Modes for AGM, reconditioning and maintenance charging, plus the ability to work as a power supply, all earned a charger an extra point each.

ACCURACY This final point only went to chargers with an output so accurate that they were safe to be used on batteries still connected to a vehicle.

A battery charger test in the September issue? In the daft timing stakes, surely that ranks alongside Christmas carols blaring out in shops in late August. We beg to differ.

You see, while battery failure is definitely a mid-winter issue, it's actually during summer and autumn that the problems leading up those failures start to manifest themselves. That means, in theory at least, that it is possible to take preventive action now to avoid trouble later on.

As we all know, batteries are simple chemical devices. The lead plates inside them convert electrical current, from the alternator or mains charger, into chemical energy within the acid. The plates work just as well the other way round, converting the chemical energy back into electrical current when needed.

Or, rather, the plates work well if they're in good condition. Over time, corrosion and sulphation combine to make increasingly large sections of the plates' surfaces inactive. Effectively, it's as if the plate area has shrunk, which obviously reduces a battery's ability to convert chemical energy into electrical current and vice versa.

When the temperature drops in winter, the ailing battery is hit with a double whammy. Engines and transmissions become heavier to crank over, thanks to

the very cold oil being more viscous. And the freezing cold bites again because that critical reaction between plate and acid is also temperature-dependent, working much more enthusiastically at higher temperatures.

So how do modern chargers help?

Well, modern batteries, though excellent in many ways, are very intolerant of abuse. If left in a state of low charge for even relatively short periods of time, sulphation sets in on the plates and it's difficult to reverse. And thanks to stereo and ECU memories, keyless entry systems and security concerns, modern cars put a draw on batteries like never before – even when the car's just sitting motionless on the drive.

So if a car isn't used that frequently, or it's left parked up during the summer holidays, attaching a smart charger and making use of its maintenance charge mode is a great way of preventing serious sulphation from starting. Many smart chargers also have desulphation cycles, which do a very effective job of reversing damage.

No battery will last forever and eventually corrosion will damage the plates excessively. But it's also true that overcharging, as a result of using an old-fashioned charger that boils the electrolyte until switched off,

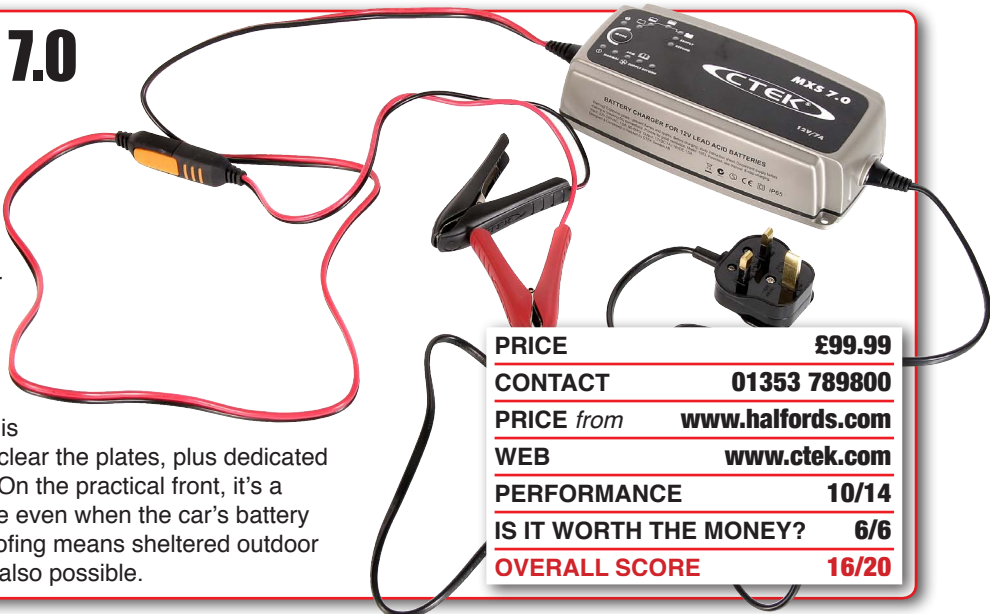
greatly increases the formation of corrosion. By contrast, smart chargers automatically switch to a safe conditioning cycle when they detect a battery is close to full charge. Most also have automatic diagnostic modes that can warn you if a battery is suffering from excessive self-discharge or from a reluctance to accept decent charge levels. Both problems are surefire warnings of trouble just around the corner.



CTEK MXS 7.0

Although renamed and slightly updated, this is essentially the same unit that won our last charger test. It's pretty expensive, but CTEK have created a charger that's a perfect trade off between price,

performance and features. The maximum current output of 7 amps takes all batteries up to 150 AH in its stride, and charge speed is further boosted by an initial voltage spike to clear the plates, plus dedicated modes for cold weather and AGM batteries. On the practical front, it's a genuine bonus that the charger is safe to use even when the car's battery is still connected. And moderate weatherproofing means sheltered outdoor usage – such as under a closed bonnet – is also possible.



PRICE	£99.99
CONTACT	01353 789800
PRICE from	www.halfords.com
WEB	www.ctek.com
PERFORMANCE	10/14
IS IT WORTH THE MONEY?	6/6
OVERALL SCORE	16/20



A bonus of switch-mode electronics is that smart chargers don't get as hot as conventional units, so some – such as CTEK's MXS 7.0 – don't need ventilation grilles and can be considered fairly weatherproof.

WHAT'S IMPORTANT?

PRACTICALITY

Short mains and battery leads have been an annoyance with chargers for decades, and decent length leads are essential for all modern chargers, regardless of the technology inside them. In fact, with so many modern chargers doubling up as long-term battery conditioners, it's also beneficial if an easy-connect lead is included. These tend to be permanently connected to the battery, and lead to a small socket you position somewhere convenient. This makes it possible to connect up the charger without even opening the bonnet, and can be a real bonus if a battery's situated in an awkward position.

SPEED It's easy to assume that the higher a charger's maximum current, the faster the charger will work, but that's not usually true. At any given voltage, a battery will only draw in a certain amount of current, regardless of how much is available. However, boost modes – which raise terminal voltage higher than ideal – certainly speed up charge times. And there are a couple of smart charger features that are known to improve charge times. Sophisticated units tend to give out a high-voltage pulsed blast at the start of the cycle, which removes loose sulphation from the plates and consequently improves the rate at which the battery converts current to chemical energy. It's also known that the smooth output from a smart charger is absorbed into the battery easier than the more random output from conventional chargers.

FEATURES Maintenance or conditioning modes can keep a battery healthy indefinitely and are very useful for infrequently used cars. Desulphation cycles are also great for reviving batteries that are known to have been mistreated. Dedicated modes for different battery technologies can result in improved charge times – AGM batteries, for instance, can withstand a much more aggressive cycle than conventional units.

ACCURACY Modern vehicle ECUs are sensitive to voltage spikes, so only the most accurate, tightly controlled outputs should be used to charge a battery while it's still connected to the vehicle.

Ring Smart ChargerPRO25

Obviously this costs a bit more than the *Best Buy*. But what a lot you get for that extra £35. A massive maximum current output of 25 amps means all batteries up to a whopping 500 AH are fair game – in other words, pretty much any battery you'll find on a car, van, SUV or 4x4. And the unit wipes the board in the versatility stakes, too. Dedicated modes are available for calcium and AGM batteries and, like the CTEK, the unit boasts a desulphation recovery cycle for tired batteries, plus a power supply mode to run 12-volt accessories or to keep a car's voltage stable during diagnostic work. Ventilation grilles, unfortunately, prohibit unsupervised outdoor usage.

CAR MECHANICS **RECOMMENDED PRODUCT**

PRICE	£134.99
CONTACT	0113 213 2000
PRICE from	www.justcarbatteries.co.uk
WEB	www.ringautomotive.co.uk
PERFORMANCE	11/14
IS IT WORTH THE MONEY?	5/6
OVERALL SCORE	16/20



Ring SmartCharger +12

Most peoples' idea of a budget battery charger is something that costs less than £5 from a garage. But if you like the CTEK, but don't have £100 to spare, this is the charger to go for. Like the *Best Buy*, there's a dedicated mode for restoring tired batteries, plus other high-tech features such as charging the battery while it's connected to the car, a conditioning mode for long-term maintenance, and that detritus-loosening pulse at the start of the charge. Ring reckon it can be used with batteries up to 300 AH, which is a little optimistic, even considering the 12 amp maximum output.

PRICE	£64.99
CONTACT	0113 213 2000
PRICE from	www.halfords.com
WEB	www.ringautomotive.co.uk
PERFORMANCE	8/14
IS IT WORTH THE MONEY?	6/6
OVERALL SCORE	14/20



BEST CAR MECHANICS BUDGET BUY

Polco 12-Amp Smart Charger

Polco claim this charger is best suited to batteries ranging between 36-84 AH, even though the maximum output is a very respectable 12 amps. Overall, this is a pretty good unit, but the biggest bugbear is that it's dearer than Ring's *Best Budget Buy* while not being as good. The charge cycle is less sophisticated and we're not keen on the automatic desulphation process. Desulphation cycles are not good for a battery's long-term health if they're repeated too frequently, hence why we prefer manual control.

PRICE	£67.95
CONTACT	01488 662770
PRICE from	www.tooled-up.com
WEB	www.caeurope.co.uk
PERFORMANCE	7/14
IS IT WORTH THE MONEY?	6/6
OVERALL SCORE	13/20



TURN

Draper 11953

After all the smart chargers, this traditional unit makes a refreshing change. Forget specialist modes for different battery technologies as your choices are limited to 12 or 24 volts and normal or fast charging. It's tempting to say that the simplicity makes the unit easy to use, but it doesn't. In fact, you'll need to keep a close eye on the ammeter to ensure you turn the unit off at the end of the charge – few modern batteries withstand excessive gassing for long. But, these niggles aside, this is a no-nonsense fast charger capable of dealing with batteries ranging from 60-200 AH.

PRICE	£51.77
CONTACT	023 8049 4333
PRICE from	www.pvrdirect.co.uk
WEB	www.drapertools.com
PERFORMANCE	5/14
IS IT WORTH THE MONEY?	6/6
OVERALL SCORE	11/20



Sealey Autocharge10D

After being surprised by the lack of advanced features on Sealey's HFC16 smart charger, it's even odder that this significantly cheaper Sealey model boasts the dedicated cycles for AGM, Gel and regular batteries. While there's still no desulphation mode, the unit does have a conditioning cycle at the end of the charge, meaning it's safe to leave it connected for long periods. Although the charger has plenty of smart features, its weight suggests pretty conventional components inside, which is probably why, despite the 10 amps maximum current, the recommended battery range is just 5-100 AH. A good all-rounder spoiled by rather short leads.

PRICE	£47.47
CONTACT	01284 757500
PRICE from	www.pvrdirect.co.uk
WEB	www.sealey.co.uk
PERFORMANCE	4/14
IS IT WORTH THE MONEY?	5/6
OVERALL SCORE	9/20



Sealey HFC16

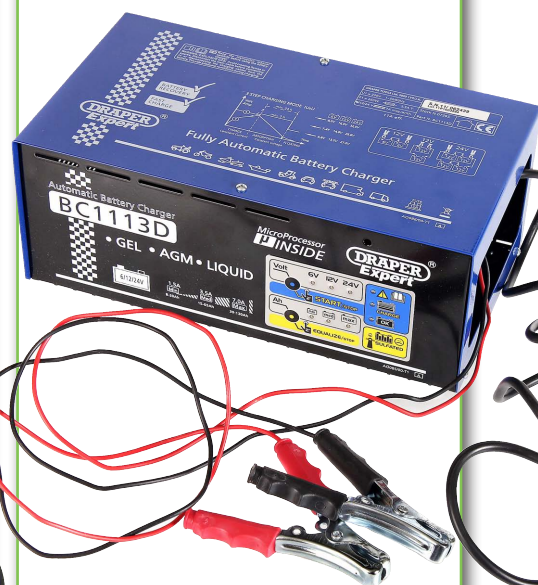
A stylish designed unit from Sealey that, unlike the other chargers in the test, actually provides somewhere to store the leads – which is just as well as they're longer than average. Another practical feature we like is the

lack of any ventilation grilles or other points of ingress for airborne dampness. In theory, this means that sheltered outdoor usage is OK, but the instructions stop short of confirming it. Ultimately, the unit is rather basic considering its price. There are no special cycles for different battery technologies, and even the usual desulphation mode is omitted. Having said that, the maximum current output of 16 amps allows use with a wide range of battery sizes from 25-300 AH.

PRICE	£118.75
CONTACT	01284 757500
PRICE from	www.pvrdirect.co.uk
WEB	www.sealey.co.uk
PERFORMANCE	8/14
IS IT WORTH THE MONEY?	4/6
OVERALL SCORE	12/20



Draper 07265



Just like Sealey's Autocharge 10D, this unit uses a small computer to drive generally conventional circuitry. The result is similar: a handful of clever features and modes, but a slightly restricted battery range of 8-130 AH. Although different battery technologies aren't specifically catered for, you do get the ever-useful conditioning and desulphation cycles. Plus, unlike any other unit here, this one caters for 6, 12, and 24-volt batteries. The big question is whether the versatility over battery voltages justifies the high price. Given the rather average maximum current output and the annoyingly short lead lengths, we say no.

PRICE	£142.76
CONTACT	0238 0494333
PRICE from	www.lawson-his.co.uk
WEB	www.drapertools.com
PERFORMANCE	7/14
IS IT WORTH THE MONEY?	1/6
OVERALL SCORE	8/20

Clarke CC80

As the cheapest charger in the group, you won't be surprised to learn that this uses completely conventional electronics and doesn't have fancy modes for recovering tired batteries or optimising charge times for different battery technologies. It's not all bad news, though, because the unit deals with both 6- and 12-volt batteries, and its battery range of 28-112 AH is respectable enough for a budget charger. But, like Draper's 11953, this is a completely basic manual charger. Left to its own devices, it will continue charging until it's physically switched off, which could potentially damage sealed modern batteries. And, budget priced or not, the 12-volt leads are simply too short.

PRICE	£41.99
CONTACT	01992 565300
PRICE from	
	www.machinemart.co.uk
WEB	www.clarkeinternational.com
PERFORMANCE	3/14
IS IT WORTH THE MONEY?	4/6
OVERALL SCORE	7/20



Clarke CC120

Clarke's second offering is much like its first, minus the 6-volt option. But, in its favour, maximum output rises to 8.5 amps, making it suitable for batteries of 40-160 AH. Again, the biggest bugbear with the charger is its completely manual operation. Modern battery technologies like calcium-calcium and calcium-silver really don't tolerate being gassed or overcharged. Yet that's exactly what will happen unless you keep a close eye on the unit's ammeter and switch it off at the appropriate time. Another niggle is the lead lengths – at least the cheaper Clarke had a reasonably long mains lead, but, on this, both the mains and 12-volt leads are almost unusably short.

OTHER BENEFITS OF SMART CHARGERS

Faster charging

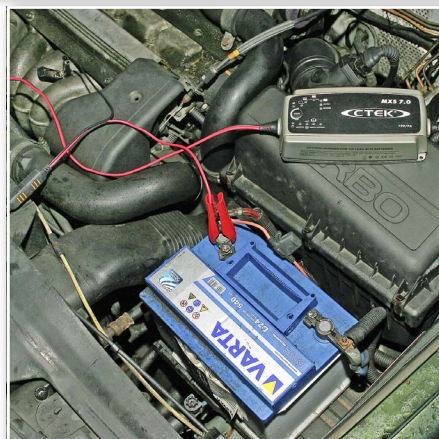
Batteries can absorb very smooth DC better than the 'lumpy' DC produced by conventional transformers and rectifiers, and the units can monitor the charge more accurately and consequently push the battery harder. Specific modes for different battery technologies often reduce charge times, too.

Safe on-car charging

As a result of the close monitoring of the charge process, battery terminal voltage always stays at safe levels. The absence of high terminal voltages or spikes, often produced by conventional chargers, means that ECUs are safe even if the battery is still connected to the car during the charge. Not needing to disconnect the battery means you don't have to reset memories on stereos and other electronic devices.

Compact & lightweight

Switch-mode electronics inside a smart charger work more efficiently than the traditional transformers and rectifiers found in conventional chargers. High output chargers, such as Ring's PRO25, would be seriously big and heavy if reliant on conventional technology.



Compatibility with a wide range of batteries

While any charger is compatible with lead acid batteries, many other battery types – such as sealed, gel and AGM – are extremely sensitive to overcharging and gassing. Consequently, the fully-automatic and closely-monitored charge cycle of a smart charger ensures safe charging even if the unit is left to its own devices for weeks on end. In contrast, old-fashioned manual chargers need to be closely monitored, especially towards the end of the charge.



Another handy CTEK feature is this auxiliary lead, which is left permanently attached to the battery. The plug on the other end is routed to a convenient location, which makes charging easier on vehicles that are frequently laid up or have a battery in an awkward location.

VERDICT

Potentially, smart chargers have many advantages over old-fashioned conventional units. Yet the only product here that seems to feature all of them is CTEK's MXS 7.0. Unsurprisingly, it takes the Best Buy title.

On the face of it, the Best Buy seems outclassed by Ring's Recommended SmartCharger PRO25. Yet while the MXS 7.0 cannot compete with the Ring in terms of maximum current output, or the size range of batteries that can be charged effectively, there's still one feature found on the CTEK that's sadly missing from the Ring: safely charging a battery while it's still connected to the vehicle is a big advantage of smart chargers, but what happens if you don't have a garage? The CTEK's sealed construction is rated to work in damp, but not directly wet, environments, such as under a closed bonnet on a driveway. The ventilation grilles on the Ring obviously run the risk of letting in dampness, even if you'd have to be very unlucky for this to actually cause a problem.

Our final award winner is another Ring: the Best Budget Buy SmartCharger + 12. Although not quite such an all-rounder as CTEK's Best Buy, it boasts a high output, plus most of the features that make smart chargers desirable, all at a very competitive price.



PRICE	£43.19
CONTACT	01992 565300
PRICE from	
	www.machinemart.co.uk
WEB	www.clarkeinternational.com
PERFORMANCE	2/14
IS IT WORTH THE MONEY?	1/6
OVERALL SCORE	3/20

